

TYPIFICATIONS OF NAMES IN
AGALINIS, GERARDIA, AND TOMANTHERA (OROBANCHACEAE)

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ABSTRACT

Seventeen neotypes and six lectotypes are designated for names in *Agalinis* Raf., *Gerardia* L., and *Tomanthera* Raf.

RESUMEN

Diecisiete neotypes y seis lectotypes son designados para nombres en *Agalinis* Raf., *Gerardia* L. y *Tomanthera* Raf.

During work on a taxonomic treatment of *Agalinis* Raf. (nom. cons.) type specimens were not located for names of species and infraspecific taxa of *Agalinis*, *Gerardia* L. (sensu Pennell 1935) and *Tomanthera* Raf. When original material of A. Michaux, F. Pursh, T. Nuttall and C.S. Rafinesque was not found within herbaria likely to contain it, direct inquiries were made to herbaria likely to contain type material. Neotypes are designated here for names for which no original material was located. The majority of neotypes were selected from our own collections so that duplicates (isoneotypes) could be deposited in several herbaria. Care was taken to ensure that new types are concordant with current usage of names as we understand them after many collective years of scientific study of *Agalinis*. Each neotype conforms to the original morphological description of the taxon and was collected from the geographical region indicated in the protologue. Descriptions of new species of *Agalinis* in Rafinesque's New Flora of North America are particularly informative and generally unambiguous.

In only one case was it not possible to identify the taxon to which a name applies although conflicting attempts have been made by various authors. The name *Gerardia erecta* Walter ex J.F. Gmel., the basionym of *Agalinis erecta* (Walter ex J.F. Gmel.) Pennell, is recommended for rejection under Art. 56.1 of the International Code of Botanical Nomenclature (McNeill et al. 2006) as outlined in McNeill et al. (2007).

An illustration by Rafinesque was chosen as lectotype for a name published by him. Syntypes annotated by Bentham, and initially selected as types by F.W. Pennell but not cited as lectotypes are designated here in second step lectotypifications. Lectotypes were selected for a name published by A. Gray and a name published by Rafinesque.

Agalinis corymbosa Raf., New Fl. N. Amer. 2:63. 1837. TYPE: U.S.A. FLORIDA. Santa Rosa Co.: T1S, 28N, S.24, SE4SW4, ca. 100 plants in mesic to wet longleaf pine savanna, 10 Oct 1998, J.F. Hays 2005 (NEOTYPE, designated here: NLU!; ISONEOTYPE: FLAS!).

Rafinesque's ample description of plants he knew from "Carolina and Florida" describes well *Agalinis pinetorum* var. *delicatula* Pennell. This a slender stemmed, narrow leaved variant of *A. harperi* Pennell.

Agalinis longifolia Raf., New Fl. N. Amer. 2:62. 1837. TYPE: U.S.A. DELAWARE. New Castle Co.: Delaware 9, just S of jct. with Co. Rd. 454, 2.4 km NW of Flemings Landing, roadside ditch bank with *Ambrosia*, *Aster*, *Setaria*, and *Bidens*, 6 Sep 1983, J.M. Canne 2476 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!, PH!).

We agree with Pennell (1929) that Rafinesque's morphological description of plants he knew from "Near streams New Jersey to Virginia" fits well the mid- Atlantic populations of *A. purpurea* (L.) Pennell.

Agalinis maritima var. ***gracilis*** Raf., New Fl. N. Amer. 2:62. 1837. TYPE: U.S.A. MASSACHUSETTS. Bristol Co.: Rte. Mass. 88 N, 0.2 mi. E of entrance to Horseneck Beach State Reservation, ca. 0.1 mi. N of the highway, abundant in *Phragmites*, with *Agalinis purpurea*, 30 Aug 1978, J.M. Canne and K.A. Hruschak 781 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!, PH!).

Agalinis (originally misspelled *Agalims*) *maritima* (Raf.) Raf. var. *gracilis* was described as "less branched

slender leaves remote," and falls within the interpopulational variation of *A. maritima* var. *maritima* in the northern portion of the species range along the coast of the New England states.

Agalinis maritima* var. *pumila Raf., New Fl. N. Amer. 2:62. 1837. TYPE: U.S.A. MASSACHUSETTS. Barnstable Co.: western end of Cape Cod, along Shore Road, 2.8 mi N of Pocasset, small salt meadow between highway and railroad, 19 Aug 1977, J.M. Canne and K.A. Hruschak 511 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!).

Rafinesque described *A. maritima* var. *pumila* as "2 or 3 inches high." Plants of this description are *A. maritima* var. *maritima* known from the coastal regions of New England. Rafinesque knew the species only from "on the Sea shores from New England to Chesapeake bay."

Agalinis microphylla Raf., New Fl. N. Amer. 2:65. 1837. TYPE: U.S.A. FLORIDA. [Duval Co.]: near Jacksonville, moist pine barrens, 1 Oct 1894, A.H. Curtiss 5272 (NEOTYPE, designated here: FSU!; ISONEOTYPES: GA!, GH!, MIN!, PH!).

We agreed with Pennell (1920, 1929, 1935) who placed *A. microphylla* Raf. in synonymy with *A. aphylla* Nutt. Rafinesque's description of a Leconte collection from Florida in the Collins herbarium is attributable only to *A. aphylla* because he noted the deeply grooved and ribbed stem, the very small, adpressed leaves, "spicate" inflorescence, short calyx lobes, and the few, alternate, virgate branches. The collection by Curtiss from Duval Co., Florida is from an area in which Leconte is known to have worked (Gray 1883).

Agalinis obtusifolia Raf. New Fl. N. Amer. 2:64. 1837. TYPE: U.S.A. FLORIDA. Santa Rosa Co.: along Florida 4, 0.7 km W of the Okaloosa Co. line, E of Munson, longleaf pine, wiregrass savanna, 25 Sep 1999, J.M. Canne-Hilliker 3427 with John E Hays (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!, PH!).

Rafinesque's mention of angular, filiform stems; sulcate, obtuse, callose (silicified), leaves; peduncles much longer than leaves; minute, callose calyx teeth; and short broad corollas clearly denote the species as treated by Pennell (1929, 1935). Rafinesque noted the species occurred in "West Tennessee, Alabama and Florida."

Agalinis palustris* var. *corymbosa Raf. New Fl. N. Amer. 2:62. 1837. TYPE: U.S.A. NEW JERSEY. Camden Co.: Atco, at jct. Jackson Rd. and Ashland Ave., moist, swampy area at margin of *Pinus* woods with *Bidens* and *Ambrosia*, 8 Sep 1983, J.M. Canne 2521 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!, PH!).

Rafinesque published *Agalinis palustris* as a new name for *Gerardia purpurea* L. (= *Agalinis purpurea* (L.) Pennell) (typ. cons.). Although *A. palustris* Raf. is an illegitimate name, in accordance with Art. 55.2 of the International Code of Botanical Nomenclature (McNeill et al. 2006) the varietal names published by Rafinesque under *A. palustris* are legitimate. *Agalinis palustris* var. *corymbosa* was described as "branches crowded corymbose." Rafinesque provided no information about the distribution of his varieties of *A. palustris* but noted that the species occurred "From New England to Carolina." He did not mention specimens seen in herbaria.

Agalinis palustris* var. *divaricata Raf. New Fl. N. Amer. 2:62. 1837. TYPE: U.S.A. SOUTH CAROLINA. Colleton Co.: U.S. 21, approx. 0.3 km S of Ruffin, 2.7 km N of the jct. with S.C. 64, weedy margin of *Pinus* woodland with *Solidago*, *Chrysopsis*, *Cyperus*, *Aster*, *Liquidambar*, *Mikania*, 7 Oct 1981, J.M. Canne 2217 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!, PH!).

Rafinesque described *A. palustris* var. *divaricata* as "less branched slender leaves remote." Both of Rafinesque's varieties of *A. palustris* fall within the interpopulational variation found in the widespread *A. purpurea* var. *purpurea*.

Agalinis setacea* var. *humilis Raf. New Fl. N. Amer. 2:64. 1837. TYPE: U.S.A. NEW JERSEY. Atlantic Co.: jct. Co. Rd. 563 and Oken St. on NE side of Egg Harbor, sandy, weedy, grassy flat at edge of *Quercus*, *Pinus* woods with *Heterotheca*, *Eupatorium*, *Solidago*, *Lespedeza*, 7 Sep 1983, J.M. Canne 2512 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!).

Rafinesque listed the range of *Agalinis setacea* as from "New Jersey to Alabama and Kentucky, Illinois" and described his varieties based on height; *A. setacea* var. *humilis* was said to be "6 to 10 inches."

Agalinis setacea* var. *major Raf. New Fl. N. Amer. 2:64. 1837. TYPE: U.S.A. SOUTH CAROLINA. Georgetown Co.: along state road 261, 7.6 km W of the jct. with US 701 in Yauhannah, and 6.8 km E of jct. with SC 513, occasional in white sand in a *Pinus*, *Quercus* flatwoods, 1 Oct 2000, J.M. Canne-Hilliker 3519 (NEOTYPE, designated here: OAC!; ISONEOTYPE: MO!).

Agalinis setacea var. *major* was described as "1 or 2 feet more branched." Plant height and degree of branching

are of little taxonomic significance because both characters vary within populations. Also, as in other species of *Agalinis*, plants of *A. setacea* in more southern locations generally grow taller and have more branches than those in the northern extremes of the species range.

Agalinis tenuifolia* var. *humilis Raf. New Fl. N. Amer. 2:64. 1837. TYPE: U.S.A. MISSOURI. Franklin Co.: E of Oak Hill at the jct. of Parshall Road and Little Boubeuse Road, locally common on weedy embankment under *Quercus* with *Trifolium*, *Solidago* and asters, 26 Sep 2004, J.M. Canne-Hilliker 3602 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!, PH!).

Rafinesque described *A. tenuifolia* var. *humilis* as “semipetal few branches,” a minor distinction of no taxonomic value for plants of this very widespread and variable species. Although Rafinesque listed the range of the species “from Canada to Florida and Missouri” he did not publish locality data for his new varieties.

Agalinis tenuifolia* var. *saxatilis Raf. New Fl. N. Amer. 2:64. 1837. TYPE: U.S.A. TENNESSEE. Polk Co.: along US 64 on N side of the Ocoee River, 7.4 km W of Gassoway Creek, steep rock embankment with *Aureolaria*, *Hamamelis*, *Quercus*, *Pinus* and *Liquidambar*, 22 Sep 1999, J.M. Canne-Hilliker 3409 (NEOTYPE, designated here: OAC!; ISONEOTYPES: GH!, MO!, NY!).

Rafinesque described this variety as “leaves longer, branches divaricate.” This also is an inadequate basis for differentiation of infraspecific taxa in this widespread species.

Agalinis virgata Raf. New Fl. N. Amer. 2:62–63. 1837. TYPE: U.S.A. NEW JERSEY. Camden Co.: Parkdale, moist sphagnous depressions, 13 Sep 1911, F.W. Pennell 3584 (NEOTYPE, designated here: PH!; ISONEOTYPE: PENN!).

Pennell (1929) was unable to locate a type for *Agalinis virgata* Raf., but nonetheless used the name for a taxon we consider to be a taxonomically insignificant variant of *A. purpurea* (L.) Pennell. Rafinesque described plants from “glades of Pine woods in South New Jersey near Mullica Hill.”

Gerardia leucanthera Raf. Florula ludov. 50. 1817. TYPE: U.S.A. LOUISIANA. Caddo Parish: along LA 789 S of Spring Ridge and N of Keatchie, 1.4 km SW of the jct. of LA 789 and Preston Road (PR102), locally common at margin of *Quercus*, *Pinus* woodland, 1 Oct 2004, J.M. Canne-Hilliker 3616 (NEOTYPE, designated here: OAC!; ISONEOTYPES: MO! NY!).

Rafinesque’s description clearly refers to a variant of *Agalinis tenuifolia* (Raf.) Raf. in which the style is held above the densely white lanose abaxial anthers. The plants were described as three feet tall, but plant height is variable within and among populations. The description by Robin (1807) upon which Rafinesque based his account of *G. leucanthera* is an excellent depiction of *A. tenuifolia*.

Gerardia maritima Raf. Med. Repos. II. 5:361. 1808. TYPE: Plate No. 8, A Collection of 29 plates and 46 figures of new genera and species of plants from North America by C.S. Rafinesque, Mertz Library of the New York Botanical Garden (LECTOTYPE, designated here: NY, digital image!).

We and Pennell (1929, 1935) were unable to locate original Rafinesque specimens referable to *G. maritima* in North American and European herbaria. However, the plate of *Gerardia maritima* by Rafinesque at NY is an identifiable portrayal of the taxon. Pennell (1929) stated that “An unpublished plate of Rafinesque’s in the library of the New York Botanical Garden denotes clearly the plant here considered.” Merrill (1949) noted that the plates at NY are likely the only remaining evidence that illustrate Rafinesque’s American species prior to the loss of Rafinesque’s herbarium in a shipwreck off Long Island in 1815. Gerard (1885) quoted the notation made by Rafinesque on the first plate of the set in which Rafinesque explained that the plates were proofs of plates lost in the shipwreck of 1815, and are figures of plants for which names were published in 1807, 1808 and 1814. Rafinesque’s plate of *Gerardia maritima* shows a complete plant and nine numbered insets which include in numerical order: a leaf; flower; calyx and style; calyx opened showing the ovary with style; longitudinal section of a corolla; capsule with calyx; lateral view of an open capsule; cross section of a capsule; and seeds. The habit sketch shows an elongate main stem with shorter basal branches, and flowers with blunt calyx lobes that are distinctive of *Agalinis maritima* (Raf.) Raf. in the northern part of its range.

Tomanthera lanceolata Raf., New Fl. N. Amer. 2:66. 1837. TYPE: *Erinus*, *Gerardia auriculata*, Muhlenberg Herbarium 851 (LECTOTYPE, designated here: PH, digital image!).

Rafinesque (1837) cited “*Erinus! africanus* Muhl.” with his description of *T. lanceolata*. Earlier, Nuttall (1818)

stated in reference to *Gerardia auriculata* Michaux (= *Tomanthera auriculata* (Michx.) Raf.) that: "This plant is considered to be *Erinus Africanus* in Muhlenberg's Catalogue, but surely neither the same species nor genus, if there be any essential character in *Erinus*." While living in Philadelphia Rafinesque evidently saw the Muhlenberg specimen because he equated it with his new *T. lanceolata*. *Erinus africanus* is a Linnaean name, so we interpret Rafinesque's citation of "Muhl." to be equivalent to "sensu Muhl., non L." Rafinesque gave the distribution of *T. lanceolata* as: "In Pensylv. and Carolina, my specimen of Collins herb. was collected by Dr. Cleaver in New Jersey..." The reference to Pennsylvania presumably referred to the specimen in Muhlenberg's herbarium. After Muhlenberg's death in 1815 his herbarium went to the American Philosophical Society at The Academy of Natural Sciences of Philadelphia in 1818 (Merrill and Hu 1949). Rafinesque's description is applicable to *Agalinis auriculata* (Michx.) S. F. Blake. The lectotype specimen has the distal segments of two flowering branches or two small plants of *Agalinis auriculata*.

Gerardia filifolia Nutt., Gen. N. Amer. pl. 2:48. 1818. TYPE: U.S.A. FLORIDA. Bay Co.: Bay Co. Rd. 388, 4.4 km E of the jct. with Florida 79, just N of West Bay, occasional in white sand with lichen, palm, *Carphephorus*, *Quercus*, and *Sabatia*, 30 Sep 1999, J.M. Canne-Hilliker 3491 (NEOTYPE, designated here: OAC!; ISONEOTYPES: MO!, NY!).

Nuttall's description is absolutely distinctive of *Agalinis filifolia* (Nutt.) Raf., the only species of *Agalinis* with "filiform, carnose, subfasciculate, and alternate" leaves.

Gerardia purpurea L. var. **crassifolia** Pursh, Fl. Amer. sept. 2:422. 1814. TYPE: U.S.A. NEW YORK. Nassau Co.: Merrick, salt marsh, 3 Oct 1916, F.W. Pennell 9359 (NEOTYPE, designated here: PH!).

Pursh's description is that of *Agalinis maritima* (Raf.) Raf. var. *maritima* from salt marshes near New York.

Gerardia aspera Benth., in DC. Prodr. 10:517–518. 1846. TYPE: plains of the Red River, 1827, Douglas s.n. (LECTOTYPE [second step], designated here by J.M. Canne-Hilliker: K!; ISOLECTOTYPE: K!).

Bentham listed three collections he had seen. From these Pennell (1935) cited the Douglas collection from Bentham's herbarium as "the actual type," a first step lectotypification, although Pennell did not annotate the type he saw at Kew.

Gerardia purpurea L. var. **parviflora** Benth., Companion Bot. Mag. 1:208. 1836. TYPE: Norway House to Canada, Drummond s.n. (NEOTYPE, designated here by J.M. Canne-Hilliker: K!).

Bentham cited a specimen from Boston for his new variety, but this specimen has not been found. The Drummond specimen from Bentham's herbarium at Kew bears his pencil notation "α" for the first of the two varieties he described for *G. purpurea*. However, it cannot be determined definitively that Bentham saw this Drummond specimen prior to publication of the new varietal name. Thus the Drummond specimen is designated as a neotype. Norway House was a trading post on Playgreen Lake, north of Lake Winnipeg, Manitoba, Canada visited by Drummond on the Second Land Arctic Expedition during 1825–1827 (Bird 1967).

Gerardia purpurea L. var. **paupercula** A. Gray, Syn. fl. N. Amer. 2:293. 1878. TYPE: U.S.A. PENNSYLVANIA. Erie Co.: Presque Isle, 25 Oct 1864, G.W. Clinton s.n. (LECTOTYPE, designated here by J. M. Canne-Hilliker: GH!; ISOLECTOTYPE: PH!).

Gray did not cite a specimen, but made the comment that a Porter name, "in herb.," should be used if the taxon was treated as a distinct species. A specimen at GH bears a hand written letter from Thomas C. Porter in which the morphology of Gray's variety is described. Porter described a collection of fruiting plants by G. W. Clinton, Oct 1864 and two collections of flowering plants made by A. P. Garber in July 1868 and 1869 at Presque Isle. The three fruiting plants of G. W. Clinton on the right hand side of the specimen, mounted directly above the lectotype label, are the lectotype at GH. This taxon is treated by us as *Agalinis purpurea* (L.) Pennell var. *parviflora* (Benth.) Boivin.

Gerardia tenuifolia Vahl var. **leptophylla** Benth. Companion Bot. Mag. 1:209. 1836. TYPE: LOUISIANA: Drummond s.n. (LECTOTYPE [second step] designated here by J.M. Canne-Hilliker: K!).

Pennell (1920) said the type of *Gerardia tenuifolia* var. *leptophylla* was a Drummond collection from "Jack-

sonville, Louisiana" (first step typification). However, in his protologue Bentham listed two collections, "Jacksonville and Louisiana, Drummond," for his new taxon. There is a specimen at Kew attributed to Drummond from Louisiana upon which Bentham wrote "*G. tenuifolia leptophylla*." This specimen, the lectotype, is a plant of *Agalinis gattingeri* (Small) Small and is annotated with this name by Pennell.

Gerardia tenuifolia Vahl var. ***macrophylla*** Benth., Companion Bot. Mag. 1:209. 1836. TYPE: St. Louis, Drummond s.n. (LECTOTYPE [second step] designated here by J.M. Canne-Hilliker: K!).

Bentham cited "Jacksonville and St. Louis, Drummond" for specimens of *G. tenuifolia* var. *macrophylla*. Pennell (1920) reported that he had seen a "Fragment of type, from Kew Herbarium, labeled St. Louis." From the two syntypes he thus selected the St. Louis specimen, via the fragment, as the lectotype (first step lectotypification).

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